

**Claim PTO/tw**

**09/30/04**

1. A method for performing a handoff between different mobile communication networks, comprising:

performing a first handoff from a first base station of a first communication network to a first sector of a gateway base station when a pilot signal strength from the gateway base station exceeds a threshold value;

performing an inter-sector handoff from the first sector of the gateway base station to a second sector of the gateway base station when a pilot signal strength of the first base station meets a drop threshold value; and

performing a second handoff from the second sector of the gateway base station to a second base station of a second communication network when a pilot signal strength of the gateway base station exceeds a threshold value.

2. The method of claim 1, wherein the inter-sector handoff is a hard handoff.

3. The method of claim 2, wherein the first and second handoffs are one of a soft handoff and a softer handoff.

4. The method of claim 1, wherein the first base station and the first sector of the gateway base station operate at a first frequency, wherein the second sector of the gateway base station and the second base station operate at a second frequency, and wherein the first and second sectors of the gateway base station comprise an overlap area of the first and second base stations.

5. The method of claim 1, wherein the gateway base station comprises a gateway control station that is communicatively coupled to a first control station of the first communication network and a second control station of the second communication network.

6. The method of claim 1, wherein a communication standard of the first communication network is different than a communication standard of the second network.

7. The method of claim 6, wherein the communication standard of the first communication network is CDMA 2G, and wherein the communication standard of the second communication network is CDMA 3G.

8. The method of claim 1, wherein performing the first handoff comprises:

performing an ADD handoff to receive a signal from the first sector of the gateway base station along with a signal from the first base station if the strength of the signal of the first sector exceeds the threshold value; and

performing a drop handoff to release the signal from the first base station if the strength of the signal of the first base station falls below the drop threshold value.

9. The method of claim 1, wherein performing the inter-sector handoff comprises switching from the first sector of the gateway base station to the second sector of the gateway base station and changing a frequency from a frequency of the first sector and the first base station to a frequency of the second sector and the second base station after performing the first handoff.

10. The method of claim 1, wherein performing the second handoff comprises:

performing an ADD handoff to receive a signal from the second sector of the gateway base station along with a signal from the second base station if the strength of the signal of the second base station exceeds the threshold value; and

performing a drop handoff to release the signal from the second sector if the strength of the signal of the second sector falls below the drop threshold value.

11. A method for making handoff in a mobile communication network having a cell 'A', a cell 'B', and a cell 'G' coupled between cell 'A' and cell 'B', comprising:

performing a first handoff from cell 'A' to an  $\alpha$  sector of cell 'G' if a strength of a signal from cell 'G' is higher than a threshold value;

performing an inter-sector hard handoff from the  $\alpha$  sector of cell 'G' to the  $\beta$  sector of cell 'G' if a signal of cell 'A' meets a drop threshold value; and

performing a second handoff from the  $\beta$  sector of cell 'G' to cell 'B' if a strength of a signal of cell 'B' is higher than a threshold value wherein cell 'A' and the  $\alpha$  sector of cell 'G' use a first frequency and signal strengths overlapped with each other and cell 'B' and the  $\beta$  sector of cell 'G' use a second frequency and signal strengths overlapped with each other.

12. The method of claim 11, wherein performing the first handoff comprises:

making an ADD handoff in which the  $\alpha$  sector of cell 'G' is added to cell 'A' if the strength of the signal of the  $\alpha$  sector of cell 'G' is higher than the threshold value; and

making a drop handoff in which cell 'A' is dropped if the strength of the signal of cell 'A' drops below the drop threshold value.

13. The method of claim 11, wherein performing the inter-sector handoff comprises switching from the  $\alpha$  sector of cell 'G' to the  $\beta$  sector of cell 'G' and changing from the first frequency to the second frequency upon performing the first handoff.

14. The method of claim 11, wherein performing the second handoff comprises:  
making an ADD handoff in which the  $\beta$  sector of cell 'G' is added to cell 'B'  
if the strength of the signal of cell 'B' is higher than the threshold value; and  
making a drop handoff in which the  $\beta$  of cell 'G' is dropped if the strength of the signal of the  $\beta$  sector of cell 'G' drops below the drop threshold value.

15. The method of claim 11, wherein a communication standard of cell 'A' is different than a communication standard of cell 'B.'

16. The method of claim 15, wherein the communication standard of the first communication network is CDMA 2G, and wherein the communication standard of the second communication network is CDMA 3G.

[15.] 12. (Amended) A system for performing a handoff between CDMA mobile communication systems, comprising:

a first mobile communication system having a first communication standard;

a second mobile communication system different from the first mobile communication system having a second communication standard; and

a gateway station in an overlap region of the first and second communication system having a first sector inclusive of a frequency group of the first mobile communication system and a second sector inclusive of a frequency group of the second mobile communication system, the gateway station configured to control and manage the handoff between the first mobile communication system and the second mobile communication system regardless of the communication stand of the first mobile communication system and the second communication system.

18. The system of claim 17, wherein the gateway station comprises:

a gateway base station configured to communicate with the base stations of the first mobile communication system and the second mobile communication system, and

a gateway control station having functions and characteristics of the first mobile communication system and the second mobile communication system for controlling the gateway base station.


19. <sup>18</sup> The system of claim 17, wherein the communication standard of the first mobile communication system is different than communication standard of the second mobile communication system.


20. <sup>19</sup> The system of claim 19, wherein the communication standard of the first mobile communication system is CDMA 2G, and wherein the communication standard of the second mobile communication system is CDMA 3G.


21. <sup>19</sup> A gateway for performing a handoff between a first communication system using a first communication standard and a second communication system using a second communication standard, comprising:


a gateway base station located in an overlap region between base stations of the first and second communication systems and having first and second sectors of coverage using first and second frequencies, respectively, and configured to communicate with a mobile terminal; and

a gateway control station communicatively coupled with each of the first and second communication networks and configured to control the gateway base station.

22.  The device of claim 21, wherein the frequency used by the first sector is a frequency used by the first communication system, and wherein the frequency used by the second sector is a frequency used by the second communication system.

23.  The method of claim 22, wherein the gateway base station acquires a mobile terminal communicating on the first communication network using the first frequency by a soft handoff, performs a hard handoff from the first sector using the first frequency to the second sector using the second frequency, and passes the mobile station to the second communication network using the second frequency by performing a soft handoff.

24.  The method of claim 21, wherein a first communication network performs first soft handoff of a call to the first sector of the gateway base station using the first frequency, the gateway base station performs an inter-frequency hard handoff of the call between the first and second sectors of the gateway base station from the first frequency to the second frequency, and wherein the gateway base station performs a second soft handoff of the call to the second communication network using the second frequency.

25.  The method of claim 24, wherein the gateway base station is configured to prevent a ping-pong effect during the handoff of the call from the first communication network to the second communication network.